THE INSTITUTION
OF ELECTRICAL
ENGINEERS

IEE

IEE PROCEEDINGS

Science, Measurement and Technology

Vol. 142, 1995

Published by
The IEE, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

IEE Proceedings

Science, Measurement and Technology

The Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

Volume 142 1995 UK ISSN 1350–2344

HONORARY EDITORS

Dr. G.W. Chantry (*Information Technology Transfer Consultant*)
Dr. M.J. Cunningham (*University of Manchester*)

Pages in issues of *IEE Proc.-Sci. Meas. Technol.*, 1995

Pages	Issue No.	Date
1–108	1	January
109–188	2	March
189–268	3	May
269–336	4	July
337–424	5	September
423–496	6	November

This publication is copyright under the Berne Convention and the International Copyright Convention. All rights reserved. Apart from any copying under the UK Copyright, Designs and Patents Act 1988, Part 1, Section 38, whereby a single copy of this article may be supplied, under certain conditions, for the purposes of research or private study, by a library of a class prescribed by The Copyright (Librarians and Archivists) (Copying of Copyright Material) Regulations 1989: SI 1989/1212, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the copyright owners. Permission is, however, not required to copy abstracts of individual contributions on condition that a full reference to the source is shown.

Authorisation to photocopy items for internal or personal use, or for the internal or personal use of specific clients, is granted by the Institution of Electrical Engineers for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the base fee of $10.00 per copy is paid directly to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA (1350–2344/95 $10.00). This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

Photocopies of individual papers published in the *IEE Proceedings* can be supplied from the IEE Library at 10p per page plus a handling charge.

The telphone number of the IEE London office is 0171 240 1871; telex: 261176 IEELDN G; facsimile: 0171 240 77 35.

The IEE is not as a body responsible for the opinions expressed by individual authors.
The IEE is a member of the Association of Learned & Professional Society Publishers.

© 1995: The Institution of Electrical Engineers

Secretary of the IEE: J.C. Williams, PhD, FEng, FIEE
Managing Editor: Gill Wheeler; *Executive Editor*: Julia Hubble

Printed by: Black Bear Press Limited, Cambridge, United Kingdom

Index

IEE Proceedings
Science, Measurement and Technology

Vol. 142, 1995

Author Index

A

Aguiar, M.W. p378
Allen, E.M. p269
Amouroux, J. p477
Anderson, D.K. p425
Appleton, S. p169
Arpaia, P. p330
Auckland, D.W. p157, p283

B

Backhouse, C.J. p389
Barrault, M. p189
Beaujean, D.A. p162
Bengtsson, T. p85
Benjamin, R. p169
Berry, D. p395
Betta, G. p330
Bodger, P.S. p176, p277
Borsi, H. p69
Boucher, T. p189
Braun, J.M. p490
Brignell, J.E. p244
Bronzeado, H. p323
Brookes, N.J. p389
Broughton, M.B. p449
Burns, N.D. p389

C

Cacciari, M. p102
Cerri, G. p206
Chaaraoui, J.A. p469
Chakrabarty, S.B. p288
Chandraker, K. p157
Chen, C.-L. p459
Chevrier, P. p189
Comte, A. p189
Contin, A. p102
Coventry, P. p201
Crichton, G.C. p29
Cullen, A.L. p169
Curnow, J.S.H. p482

D

Dale, B.G. p463
Dallago, E. p223
Damstra, G.C. p125
Das, B.N. p288
Dawson, B.E. p255
De Leo, R. p206
Delalondre, C. p189
Dewsbury, M. p463
Dey, A. p267
Dickin, F.J. p313
Dunlop, I. p307

E

Edwards, J.M. p378
El-Sawy Mohamed, A.M. p293
Ennis, M.G. p201
Evans, W.A. p114

F

Farish, O. p237
Fawcett, G. p109
Fernandes, P. p299
Fievet, C. p189
Forghani, B. p133
Foulon-Belkacemi, N. p477
Freeston, I.L. p425
Fruth, B.A. p22
Fujimoto, N. p490
Fulton, W.S. p433

G

Gatellet, J. p11
Gaynor, P.T. p176, p277
German, D.M. p442
Gilders, P. p378
Gill, M.S. p109
Gjaerde, A.C. p17
Gockenbach, E. p69
Goldman, A. p11, p477
Goldman, M. p11, p477
Golra, M.A. p157
Griffiths, H.D. p169
Gross, D.W. p22
Gulski, E. p51

H

Haddad, A. p442
Hampton, B.F. p237
Ho, C.-J. p183
Holboll, J.T. p490
Hoof, M. p95
Hucker, T. p89
Hudson, N. p269

I

Ifeachor, E.C. p482
Ingersoll, T. p114
Irgens, C.S. p345

J

Jain, D.L. p267
Jayawant, B.V. p255
Jayne, M.G. p162
Jervis, B.W. p269
Johnstone, W. p109
Jones, G.R. p201, p469
Jonsson, B. p85
Judd, M.D. p237
Jung-Fang Pern p231

K

Karwowski, A. p213
Kemp, I.J. p4
Kertesz, V. p125
Khosrowbeygi, A. p169
Kochhar, A.K. p411
Kranz, H.-G. p89
Kwan, K.S. p453

L

Lakhtakia, A. p262
Langella, A. p330
Lapovok, A. p151
Las, T. p37
Leach, G.R. p249
Leijon, M. p85
Liao, T.W. p404
Linkens, D.A. p362
Lipczynski, R.T. p433
Liu, C.-K. p183
Lynch, A.C. p169

M

Mallick, A.K. p288
Maly, D.K. p453
Mann, L. p404
Mariani Primiani, V. p206
Marley, W.A. p442
McAllister, I.W. p29
McCallion, K. p109
McNab, A. p307
Metwally, I.A. p442
Ming, L. p85
Montanari, G.C. p102
Moodie, D. p109
Morshuis, P.H.F. p62
Murgatroyd, I.S. p378

N

Naim, M.M. p395
Naylor, P. p442
Newbery, P.G. p162
Norris, W.T. p142, p495

O

Okamoto, T. p75
Oke, S. p269
Oldham, K. p411
Outram, N.J. p482

P

Pandya, K.V. p371
Parnaby, J. p338
Patsch, R. p95
Peat, B.J. p350
Pedersen, A. p29
Pham, D.T. p350

R

Rabach, G. p102
Rashid, A. p283
Robin-Jouan, P. p189

S

Saatchi, M.R. p269
Sassone, G. p223
Serres, E. p189
Sheng-Nian Yeh p231
Spencer, J. p201
Spencer, J.W. p469
Stone, G.C. p490
Sutanto, E.L. p417

T

Tanaka, T. p46, p75
Texier, V. p189
Thacker, S.M. p411
Thursby, G. p109
Tong, Y.K. p442
Towill, D.R. p395
Tozer, R.C. p425
Turner, D.R. p201

V

Van Brunt, R.J. p37
Van Eetvelt, P.W.J. p482
Vanacore, M. p330
Varlow, B.R. p157, p283
Verite, J.C. p189
Vishnevsky, A. p151
von Glahn, P. p37

W

Wang, J.S. p469
Wang, M. p313
Wang, S.-C. p459
Warwick, K. p417
Waters, R.T. p442
Webb, J.P. p133
Weiglhofer, W.S. p262
Wenzel, D. p69
Weston, R.H. p378
White, N.M. p244, p249
Whorlow, R.J. p255
Williams, R.A. p313
Witalis, E.A. p197
Wood, J.K. p201

Y

Yacamini, R. p323
Yang, Y.Y. p362

Z

Zeddam, A. p213
Zodhi, M.E. p404
Zou, Q. p404

AUTOMATIC TEST SYSTEMS

Computer-aided transducer calibration system for a practical power system p459
Design of a virtual LCR component meter p114
New approach in partial discharge diagnosis and pattern recognition p89
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95

BIOLOGICAL AND BIOMEDICAL SYSTEMS

Analytic solution of the forward problem for induced current electrical impedance tomography systems p425
Balloon model of biological cell electropermeabilisation in relation to the radius dependence of membrane dielectric breakdown p277
Electrofusion processes: theoretical evaluation of high electric field effects on cellular transmembrane potentials p176
Optimising the time to solution in electrical impedance tomography p433
Signal processing of the contingent negative variation in schizophrenia using multilayer perceptrons and predictive statistical diagnosis p269
Techniques for optimal enhancement and feature extraction of fetal electrocardiogram p482

CABLES AND OVERHEAD LINES

Water treeing in insulating liquids p157

CALIBRATION

Computer-aided transducer calibration system for a practical power system p459

CIRCUIT BREAKERS

Arc modelling in SF_6 circuit breakers p189
Current limiting properties of an expanding helical arc p201
Determination of M-effect diffusion parameters in high breaking capacity fuses p162
Development and application of a 10 MHz digital system for current-zero measurements p125
New approach in partial discharge diagnosis and pattern recognition p89
Optical-fibre monitoring of high frequency parasitic arcs in a puffer circuit breaker p469

CIRCUIT COMPONENTS

Design of a virtual LCR component meter p114
Determination of M-effect diffusion parameters in high breaking capacity fuses p162
Excitation of thick-film resonant sensor structures p244
High-frequency current transducers in a control system for quasiresonant power convertors p223

CIRCUIT THEORY AND DESIGN

Frequency dependence of AC-interference susceptibility in digital ICs p183
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
Statistical process control: examination of use in a small printed circuit board manufacturer p463

COMPUTER APPLICATIONS

Arc modelling in SF_6 circuit breakers p189
Computer-aided transducer calibration system for a practical power system p459
Design of a virtual LCR component meter p114
Determination of M-effect diffusion parameters in high breaking capacity fuses p162
Expert system for the optimum design of measurement systems p330
New approach in partial discharge diagnosis and pattern recognition p89
Online PCBN tool failure monitoring system based on acoustic emission signatures p404
Partial discharge pulse distribution pattern analysis p46
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95
Statistical process control: examination of use in a small printed circuit board manufacturer p463
Structured methodology for the selection and effective implementation of manufacturing control systems p411

CONVERTORS

High-frequency current transducers in a control system for quasiresonant power convertors p223

CYBERNETICS AND ROBOTICS

Hybrid method for systems analysis p350

DATA HANDLING

Partial discharge signal generation transmission and acquisition p22

DIELECTRIC MATERIALS AND DEVICES

Charge images in a dielectric sphere p495
Excitation of thick-film resonant sensor structures p244
Fabrication of a thick film sensor employing an ultrasonic oscillator p249

EDDY CURRENTS

Finite-element variational formulation of the impedance boundary condition for solving eddy current problems p293
General approach to prove the existence and uniqueness of the solution in vector potential formulations of 3-D eddy current problems p299
T-Ω method using hierarchal edge elements p133

ELECTRIC DISCHARGES

An approach to partial-discharge investigation by height-distribution analysis p102
Arc modelling in SF_6 circuit breakers p189
Directivity of acoustic signals from partial discharges in oil p85
Discharge pattern recognition in high voltage equipment p51
Effect of barriers on tree growth in solid insulation p283
Measurements of void gas pressure during combined thermal and partial discharge ageing of epoxy p17
New approach in partial discharge diagnosis and pattern recognition p89
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Partial discharge detection: theoretical and practical aspects p29
Partial discharge mechanisms in voids related to dielectric degradation p62
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge pulse distribution pattern analysis p46
Partial discharge signal generation transmission and acquisition p22
Partial discharges in flat, dielectric/metallic bounded cavities p490
Physical and chemical aspects of partial discharges and their effects on materials p11
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69
Transformation of nodules into crystals on polymers submitted to corona discharges with streamers p477
Water treeing in insulating liquids p157

ELECTROMAGNETIC INTERFERENCE

Frequency dependence of AC-interference susceptibility in digital ICs p183
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206

ELECTROMAGNETIC THEORY

Free-wave measurement of permeability and permittivity of ferrites at millimetre-wave frequencies p169
Frequency dependence of AC-interference susceptibility in digital ICs p183
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
Transient currents on lightning protection systems due to the indirect lightning effect p213

ELECTROMAGNETISM

Charge images in a dielectric sphere p142
Conservative methods in boundary-element calculations of static fields p151
Covariances and invariances of the Beltrami-Maxwell postulates p262
Current limiting properties of an expanding helical arc p201
Finite-element variational formulation of the impedance boundary condition for solving eddy current problems p293
Free-wave measurement of permeability and permittivity of ferrites at millimetre-wave frequencies p169
General approach to prove the existence and uniqueness of the solution in vector potential formulations of 3-D eddy current problems p299
New transducerless magnetic suspension system p255
Origin, location, magnitude and consequences of recoil in the plasma armature railgun p197
Partial discharge detection: theoretical and practical aspects p29
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
T-Ω method using hierarchal edge elements p133

ELECTRONIC CIRCUITS

Excitation of thick-film resonant sensor structures p244
Fabrication of a thick film sensor employing an ultrasonic oscillator p249
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
Statistical process control: examination of use in a small printed circuit board manufacturer p463

ENERGY CONVERSION

Optimal battery energy storage system (BESS) charge scheduling with dynamic programming p453

EXPERT SYSTEMS

Design support based on projection of information across the product-development life cycle by means of case-based reasoning p345
Expert system for the optimum design of measurement systems p330
Hybrid method for systems analysis p350
Structured methodology for the selection and effective implementation of manufacturing control systems p411

FIBRE OPTICS

In line fibre optic electric field sensing technique without interruption of the fibre p109

GENERATORS

An approach to partial-discharge investigation by height-distribution analysis p102

INSTRUMENTATION AND MEASUREMENT

Computer-aided transducer calibration system for a practical power system p459
Directivity of acoustic signals from partial discharges in oil p85
Excitation of thick-film resonant sensor structures p244
Expert system for the optimum design of measurement systems p330
Fabrication of a thick film sensor employing an ultrasonic oscillator p249
High-frequency current transducers in a control system for quasiresonant power convertors p223
In line fibre optic electric field sensing technique without interruption of the fibre p109
New approach in partial discharge diagnosis and pattern recognition p89
Optical-fibre monitoring of high frequency parasitic arcs in a puffer circuit breaker p469
Partial discharge plant-monitoring technology: present and future developments p4

INSULATED GATE FIELD EFFECT TRANSISTORS

High-frequency current transducers in a control system for quasiresonant power convertors p223

INSULATORS AND INSULATION

Effect of barriers on tree growth in solid insulation p283
Measurements of void gas pressure during combined thermal and partial discharge ageing of epoxy p17
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Optical-fibre monitoring of high frequency parasitic arcs in a puffer circuit breaker p469
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge pulse distribution pattern analysis p46
Physical and chemical aspects of partial discharges and their effects on materials p11
Water treeing in insulating liquids p157

INTEGRATED CIRCUITS

Frequency dependence of AC-interference susceptibility in digital ICs p183

INTERFERENCE SUPPRESSION

Frequency dependence of AC-interference susceptibility in digital ICs p183
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
Transient currents on lightning protection systems due to the indirect lightning effect p213

LOGIC AND SWITCHING CIRCUITS

Frequency dependence of AC-interference susceptibility in digital ICs p183

MAGNETIC MATERIALS AND DEVICES

Free-wave measurement of permeability and permittivity of ferrites at millimetre-wave frequencies p169
Use of a novel magnetoresistive angle sensor for controlling switched-reluctance motor speed p449

MATERIALS AND MATERIALS TESTING

Shape classification of flaw indications in three-dimensional ultrasonic images p307

MATHEMATICAL TECHNIQUES

Conservative methods in boundary-element calculations of static fields p151
Discharge pattern recognition in high voltage equipment p51
Finite-element variational formulation of the impedance boundary condition for solving eddy current problems p293
Hybrid method for systems analysis p350
Multivariable cluster analysis for high-speed industrial machinery p417
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Online PCBN tool failure monitoring system based on acoustic emission signatures p404
Optimal battery energy storage system (BESS) charge scheduling with dynamic programming p453
Optimising the time to solution in electrical impedance tomography p433
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge pulse distribution pattern analysis p46
Review of modelling techniques and tools for decision making in manufacturing management p371
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
Scheduling and optimisation for heating of steel soaking pits: case study for hybrid systems p362

MEASUREMENT OF SPECIFIC VARIABLES

Analytic solution of the forward problem for induced current electrical impedance tomography systems p425
Development and application of a 10 MHz digital system for current-zero measurements p125
Directivity of acoustic signals from partial discharges in oil p85
Excitation of thick-film resonant sensor structures p244
Expert system for the optimum design of measurement systems p330
Fabrication of a thick film sensor employing an ultrasonic oscillator p249
Free-wave measurement of permeability and permittivity of ferrites at millimetre-wave frequencies p169
High-frequency current transducers in a control system for quasiresonant power convertors p223
In line fibre optic electric field sensing technique without interruption of the fibre p109
Measurements of void gas pressure during combined thermal and partial discharge ageing of epoxy p17
Modelling and analysis of electrically conducting vessels and pipelines in electrical resistance process tomography p313
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Optical-fibre monitoring of high frequency parasitic arcs in a puffer circuit breaker p469
Optimising the time to solution in electrical impedance tomography p433
Partial discharge detection: theoretical and practical aspects p29
Partial discharge mechanisms in voids related to dielectric degradation p62
Partial discharge plant-monitoring technology: present and future developments p4
Partial discharge signal generation transmission and acquisition p22
Partial discharges in flat, dielectric/metallic bounded cavities p490
Physical and chemical aspects of partial discharges and their effects on materials p11
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95
Use of a novel magnetoresistive angle sensor for controlling switched-reluctance motor speed p449

MEASUREMENT SCIENCE

Computer-aided transducer calibration system for a practical power system p459

MICROWAVE MEASUREMENT TECHNIQUES

Broadband couplers for UHF detection of partial discharge in gas-insulated substations p237
Free-wave measurement of permeability and permittivity of ferrites at millimetre-wave frequencies p169

MILITARY SYSTEMS

Origin, location, magnitude and consequences of recoil in the plasma armature railgun p197

MULTIVARIABLE CONTROL SYSTEMS

Multivariable cluster analysis for high-speed industrial machinery p417

NEURAL NETS

Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge pulse distribution pattern analysis p46
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69
Shape classification of flaw indications in three-dimensional ultrasonic images p307
Signal processing of the contingent negative variation in schizophrenia using multilayer perceptrons and predictive statistical diagnosis p269

NONELECTRIC VARIABLES CONTROL

Use of a novel magnetoresistive angle sensor for controlling switched-reluctance motor speed p449

NUMERICAL ANALYSIS

Calculating the current distribution in power transformer windings using finite element analysis with circuit constraints p231
Conservative methods in boundary-element calculations of static fields p151
Design of a virtual LCR component meter p114
Finite-element variational formulation of the impedance boundary condition for solving eddy current problems p293
Modelling and analysis of electrically conducting vessels and pipelines in electrical resistance process tomography p313
Multidimensional Laplace transforms for solution of nonlinear equations p267
Scattering matrix approach for frequency and time domain crosstalk analysis in multilayer PCBs p206
T-Ω method using hierarchal edge elements p133
Transient currents on lightning protection systems due to the indirect lightning effect p213

OPTICAL IMAGE PROCESSING

An approach to partial-discharge investigation by height-distribution analysis p102
Discharge pattern recognition in high voltage equipment p51
New approach in partial discharge diagnosis and pattern recognition p89
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69

OPTICAL MATERIALS AND DEVICES

In line fibre optic electric field sensing technique without interruption of the fibre p109

OPTIMISATION

Optimal battery energy storage system (BESS) charge scheduling with dynamic programming p453
Optimising the time to solution in electrical impedance tomography p433
Scheduling and optimisation for heating of steel soaking pits: case study for hybrid systems p362

PATTERN RECOGNITION

Discharge pattern recognition in high voltage equipment p51
Multivariable cluster analysis for high-speed industrial machinery p417
New approach in partial discharge diagnosis and pattern recognition p89
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69

POWER ENGINEERING COMPUTING

Calculating the current distribution in power transformer windings using finite element analysis with circuit constraints p231
Computer-aided transducer calibration system for a practical power system p459
Discharge pattern recognition in high voltage equipment p51
New approach in partial discharge diagnosis and pattern recognition p89
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69
Transient currents on lightning protection systems due to the indirect lightning effect p213

POWER SYSTEM CONTROL

High-frequency current transducers in a control system for quasiresonant power convertors p223
New transducerless magnetic suspension system p255
Use of a novel magnetoresistive angle sensor for controlling switched-reluctance motor speed p449

POWER SYSTEM PROTECTION

Current limiting properties of an expanding helical arc p201
Direct voltage and trapped charge effects on the protective characteristic of ZnO surge arresters p442
Transient currents on lightning protection systems due to the indirect lightning effect p213

POWER SYSTEMS AND PLANTS

Broadband couplers for UHF detection of partial discharge in gas-insulated substations p237
Computer-aided transducer calibration system for a practical power system p459
High-frequency current transducers in a control system for quasiresonant power convertors p223
New transducerless magnetic suspension system p255
Optimal battery energy storage system (BESS) charge scheduling with dynamic programming p453
Partial discharge plant-monitoring technology: present and future developments p4

PROBABILITY AND STATISTICS

An approach to partial-discharge investigation by height-distribution analysis p102
Discharge pattern recognition in high voltage equipment p51
Nonstationary behaviour of partial discharge during discharge induced ageing of dielectrics p37
Online PCBN tool failure monitoring system based on acoustic emission signatures p404
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge pulse distribution pattern analysis p46

PRODUCTION ENGINEERING

An approach to partial-discharge investigation by height-distribution analysis p102
Business process re-engineering an electronic products supply chain p395
Contingent approach to the application of concurrent engineering to the product introduction process p389
Design of a virtual LCR component meter p114
Design of the new product introduction process to achieve world class benchmarks p338
Design support based on projection of information across the product-development life cycle by means of case-based reasoning p345
Direct voltage and trapped charge effects on the protective characteristic of ZnO surge arresters p442
Methods and tools for manufacturing enterprise modelling and model enactment p378
Multivariable cluster analysis for high-speed industrial machinery p417
New approach in partial discharge diagnosis and pattern recognition p89
Partial discharge mechanisms in voids related to dielectric degradation p62
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Partial discharge signal generation transmission and acquisition p22
Partial discharges in flat, dielectric/metallic bounded cavities p490
Pulse-sequence analysis: a new method for investigating the physics of PD-induced ageing p95
Review of modelling techniques and tools for decision making in manufacturing management p371
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69
Statistical process control: examination of use in a small printed circuit board manufacturer p463
Structured methodology for the selection and effective implementation of manufacturing control systems p411

PROGRAMMING SUPPORT

Methods and tools for manufacturing enterprise modelling and model enactment p378

SIGNAL PROCESSING

Development and application of a 10 MHz digital system for current-zero measurements p125
Directivity of acoustic signals from partial discharges in oil p85
Online PCBN tool failure monitoring system based on acoustic emission signatures p404
Partial discharge pulse distribution pattern analysis p46
Partial discharge signal generation transmission and acquisition p22
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69
Signal processing of the contingent negative variation in schizophrenia using multilayer perceptrons and predictive statistical diagnosis p269
Techniques for optimal enhancement and feature extraction of fetal electrocardiogram p482

SINGLE ANTENNAS

Broadband couplers for UHF detection of partial discharge in gas-insulated substations p237

SONICS AND ULTRASONICS

Directivity of acoustic signals from partial discharges in oil p85
Fabrication of a thick film sensor employing an ultrasonic oscillator p249
New approach in partial discharge diagnosis and pattern recognition p89
Online PCBN tool failure monitoring system based on acoustic emission signatures p404
Partial discharge plant-monitoring technology: present and future developments p4
Shape classification of flaw indications in three-dimensional ultrasonic images p307

SWITCHGEAR

Arc modelling in SF_6 circuit breakers p189
Current limiting properties of an expanding helical arc p201
Determination of M-effect diffusion parameters in high breaking capacity fuses p162
Development and application of a 10 MHz digital system for current-zero measurements p125
New approach in partial discharge diagnosis and pattern recognition p89
Optical-fibre monitoring of high frequency parasitic arcs in a puffer circuit breaker p469

SYNCHRONOUS MACHINES

Multidimensional Laplace transforms for solution of nonlinear equations p267
Use of a novel magnetoresistive angle sensor for controlling switched-reluctance motor speed p449

SYSTEMS THEORY

Multivariable cluster analysis for high-speed industrial machinery p417
Partial discharge pattern recognition for three kinds of model electrodes with a neural network p75
Scheduling and optimisation for heating of steel soaking pits: case study for hybrid systems p362

TRANSFORMERS

Calculating the current distribution in power transformer windings using finite element analysis with circuit constraints p231
Design of a virtual LCR component meter p114
Phenomenon of sympathetic interaction between transformers caused by inrush transients p323
Separation of partial discharges from pulse-shaped noise signals with the help of neural networks p69

TRANSMISSION LINE THEORY

Electromagnetic analysis of a two-wire transmission line of parallel cylinders of unequal radii with dielectric coating p288